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Abstract

TECHNOLOGY OF METAL ZIRCONIUM PRODUCTION

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The electrolytic preparation of zirconium attracts more and more attention and is considered to be one of the most promising methods of the industrial production of this metal. However, the wide application of this method is restricted because it is not sufficiently studied and because of the unsatisfactory process equipment. In this work an attempt was made to overcome some of these difficulties. In the investigations carried out the emphasis was placed on bringing to light the sources of the contamination of the prepared metal with oxygen as well as on the measures of eliminating these sources.

The sources of the oxygen and nitrogen contamination of the metal prepared in open electrolytic baths and ways of their penetration into the cathode deposit are discovered. The paper reveals the role of the upper part of the cathode deposit, protruding through the electrolyte, and the electrolyte surface, absorbing oxygen from air, in the process of the nitrogen and oxygen contamination of zirconium.

The methods of preventing the contamination of the metal with oxygen and nitrogen are discussed.

The experimental data on the use of hollow cooled cathodes are given.

The data are available, obtained in closed electrolizers.

The main oxygen and nitrogen contamination sources of the metal are discussed.

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The problem of the humidity of calcium chloride and K_2ZrF_6 used as electrolyte components is discussed. The methods of salt drying in vacuum and air at the atmospheric pressure are considered.

The procedure for the determination of oxygen content in K_2ZrF_6 is described.

In the paper the data are also available on the electrolytic refining of zirconium and on the effect of the electrolysis schedule on the degree of refining zirconium from hafnium.

The design of the closed electrolyzer is briefly described.